Panel Session 6: Economies' Vision for the 21st Century Grid

Philippines Smart Grid Vision

By

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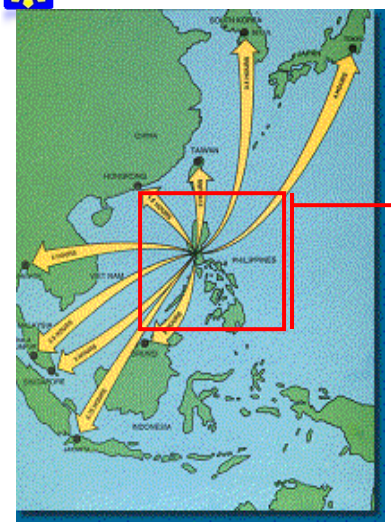
Outline of Presentation

- Introduction
- Overview of the Philippine Electric Power Industry
  - Characteristics
  - Current Challenges
- Smart Grid Vision
- The Way Forward

The Philippines At a Glance



Land area:	***300,000 sq. kms***
Population:	***~98 Million***
Literacy rate:	***93%***
Climate:	***Tropical (23-32 ℃)***
Language:	***Filipino***
Government:	***Democratic***
Religion:	***Dominantly Roman Catholic***
Currency:	***Peso***

With more than 7,100 islands, providing electricity services remains to be the biggest challenge to the Government …

The Department of Energy

VISION

- Commit to a responsive and efficient energy sector;
- Promote economic growth with social equity

MISSION

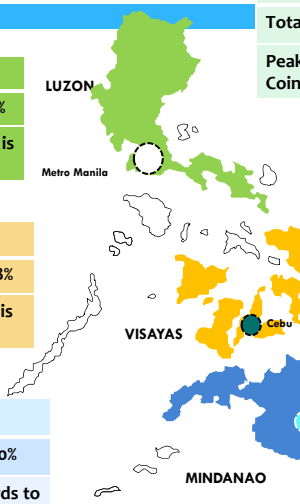
- To formulate and ensure implementation of energy policies and programs that foster economic growth and improve the quality of life of the Filipino;
- In partnership with the private sector, to provide stable, efficient, and reasonably priced energy; accelerate rural electrification and increase utilization of indigenous and clean energy.

Overview of the Philippine Electric Power Industry

Total Installed Capacity = 16,233 MW

Total Dependable Capacity = 14,597 MW

Peak Demand = 10,216 MW* (based on Non-Coincident Peak Demand for 2011)



Peak Demand: 7,552 MW

HH Electrification Level: 86%

10,450 MW of new capacity is needed onwards to 2030

Capacities are concentrated in the North and South Luzon, while load center is in Metro Manila

Peak Demand: 1,481 MW

HH Electrification Level: 78%

2,000 MW of new capacity is needed onwards to 2030

Capacities are concentrated in Cebu (Coal) and Leyte-Samar (Geothermal) Sub-Grid

Peak Demand: 1,346 MW

HH Electrification Level: 60%

1,950 MW is needed onwards to 2030

Highly dependent on water levels of Agus and Pulangi rivers, while most of the capacities are located in the north (39%), while load centers are in the south east (30%) and south west (18%)

Note: HHC – as of Dec. 2011; ECs only

Note: Transparent islands in the above diagram are not covered by NGCP's network.

Characteristics of the Philippines Power Industry

- Restructured in June 2001
- Rates Unbundled; Cross Subsidies Removed
- Luzon and Visayas Grids Operating as a Single Electricity Market
- Achieved Significant Privatization of Government Assets
  - Broadened ownership in Generation and Supply Sector
- Open Access and Retail Competition
  - …. to commence soon ….

The Philippines Current Challenges

Climate Change Mitigation	• Promote the use of clean technology
Economic Growth and Development	• Meet future demand for electricity at affordable /reasonable rates
Energy Supply Security	• Diversify sources of fuel and technologies • Conserve and manage current and future energy demand
Power Grid Development	• Integrate RE sources • Foster competition in the generation and supply sectors; provision of stable, reliable and robust transmission and distribution systems

SMART GRID VISION

- NGCP
- MERALCO

Current Smart Grid Users in the Philippines

1. Transmission/System Operator (NGCP)
   - Energy Management System
   - Supervisory Control and Data Acquisition (SCADA)
   - Automatic Meter Reading (AMR)
2. Distribution Utilities (MERALCO, BENECO, VECO, and DLPC)
   - SCADA (Distribution System)
   - AMR (Pilot only)
   - Customer Information System
   - Automated Mapping/Facilities Management (MERALCO Pilot only)
3. Market Operator (PEMC)
   - Market Management System

Smart Grid Development in NGCP

- **Advanced SCADA Project.**
- **Overall Command Center Project.**
- **FS for First Smart Grid Substation in Philippines.**
- **Renewable Energy Integration.**

NGCP and SGCC signed smart grid strategic cooperation memorandum in Feb, 2011.

NGCP already sent smart grid technical communication delegates to SGCC in 2011.

Source: NGCP

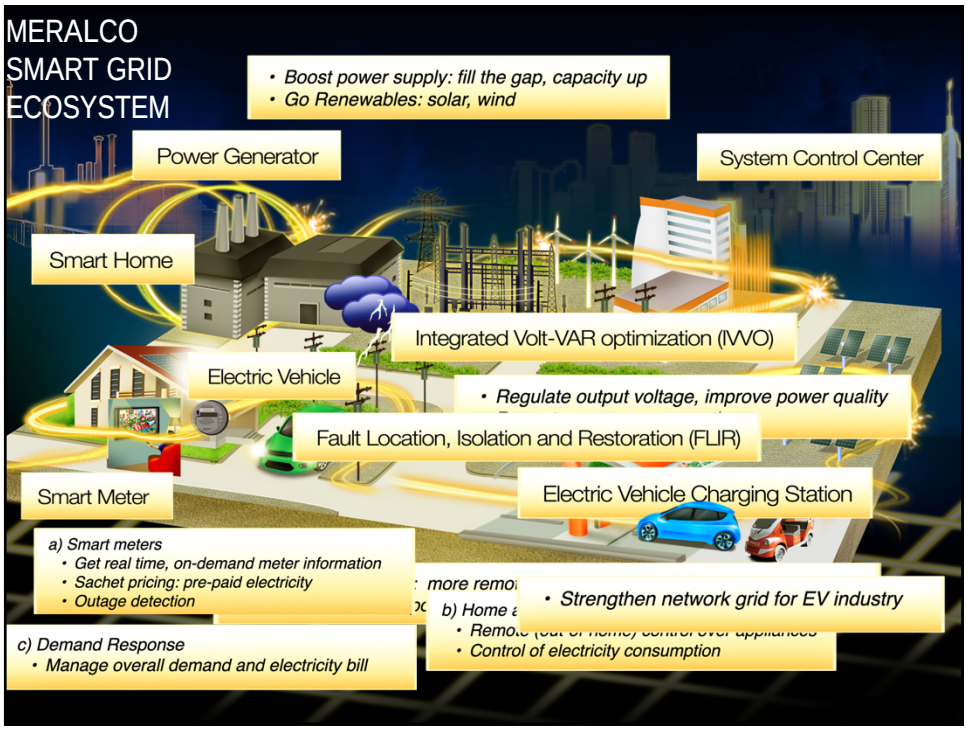
On March 16, 2021, the Philippines will shine brightly on its Quincentennial Year.

10 years from today, the Philippines will mark the 500th year since Ferdinand Magellan put the economy on the world map.

In a span of 10 years, Meralco will play a key role in driving the nation's journey to a more energized future:

- With our own **Power Generation**, we will enable Filipinos to enjoy more reliable and affordable electricity.
- With our **wider distribution network**, we will reach more homes and businesses.
- With our **Smart Grid** and through our **alliance with PLDT, Smart and Metro Pacific**, we will allow Filipinos to experience:
  - A fully-automated home powered by a Home Area Network
  - Maximum control of electricity consumption through pre-paid electricity
  - Growth in business and the economy with affordable electricity rates
- Meralco, as a responsible corporate citizen, will invest in and power **Electric Vehicles**, one of our efforts to keep our planet green.

We believe that come March 16, 2021, the power of the Filipino will shine through more than ever.



The Way Forward

1. Develop Policy and Regulatory Framework for Smart Grid in the Philippines – by 2013
   - Create an Inter-Agency TWG (IA-TWG) to Conduct Policy and Technical Research and Studies
   - Start-up Capacity Building Program (best practices of pioneer economies such as USA, Australia, China, Japan, among others)
   - Pursue International Cooperation (APEC and even international standards associations such as IEEE and IEC).
2. Develop the Road Map/Roll Out Plan for Smart Grid Implementation – by 2013/2014
   - Phase-in Approach? Timelines? Coverage?
   - Standards Development including interoperability
   - Integration Plan e.g., EVs, RETs
   - IEC Program/Continuing R&D Activities

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END OF PRESENTATION
Thank You and Mabuhay!!!

Philippines Smart Grid Vision

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Power Developments

- The economy's peak demand will grow at an average annual rate of 4.47% for Luzon and 4.55% for Visayas and 4.56% for Mindanao
- The economy needs additional generating capacity of 14,400 MW from 2011-2030 on top of the committed projects
  - 10,450 MW in Luzon Grid (300 MW in 2015)
  - 2,000 MW in Visayas Grid (100 MW in 2015)
  - 1,950 MW in Mindanao Grid (50 MW in 2012 and 100 MW in 2013)

Promote Energy Efficiency as a Way of Life

2-PRONGED PROGRAM

Power Conservation and Demand Management Program

Fuel Efficiency & Conservation Program

BRIGHT NOW! DO RIGHT. BE BRIGHT.

DOE

Distribution Utilities Development Plan

2010-2019

- Number of Customers will increase by 3.5% from 14,102 in 2010 to 18,984 by 2019;
- Non-Coincident Peak Demand is expected to grow by an annual average rate of 3.8% from 9,511 MW in 2010 to 13,113 MW by 2019;
- Energy Requirements will grow by 4.1% from 53,877 GWh in 2010 to 76,146 GWh by 2019;
- CAPEX requirements (P68.1 Billion):
  - P18.4 Billion for Electrification Projects
  - P17.2 Billion for construction of 17,630 ckt-kms of new lines
  - P11.1 Billion for additional substation capacity totaling 5,232 MVA
  - P21.3 Billion for rehab and upgrading of 26,565 ckt-kms of lines

2011 Transmission Development Plan

Major Planning Considerations

- Develop a unified national grid capable of transmitting reliable power across the economy.
- Comply with the Grid Code and the requirements of competitive retail electricity market.
- Accommodate all the power plants approved by DOE in its Power Development Program.
- Comply with mandates under RA 9513, in particular to provide priority connection to Renewable Energy-based plants.
- Upgrade the aging transmission and sub-transmission facilities, including primary, secondary and protection equipment.
- Identify and recommend the ideal connection points for new power plants which will require no major grid reinforcement.